

**The Indigenous Sentinels  
Network (ISN):  
A Tool for Community-Based  
Monitoring (CBM)  
& Citizen Science (CS)**

**Nunap inoqqaavisa  
nakkutilliisuisa  
attaveqaqatigiiffiat  
Inoqarfiusut tunngavigalugit  
nalunaarsuineq (CBM)  
& Iisimatusarfiillu  
innuttaasunit (CS)**



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**[www.sentinelnetwork.org](http://www.sentinelnetwork.org)**



**Welcome to St. Paul Island, Alaska**

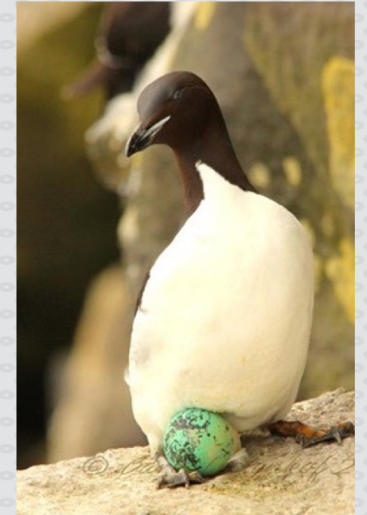
**St. Paul Island, Alaska-mut tikilluarit**





## Subsistence Lifestyle

- Hunting, fishing, and harvesting of island resources
- Commercial fishing economy – halibut longline fishing fleet
- Co-management and resource monitoring help maintain traditional ways of life.



## Imminut napatinnermik toqqammaveqarluni inooriaaseq

- Piniarneq aalisarneq qeqertamilu pisuussutinik atuinnermik toqqammaveqarneq
- Tunisassiassanik aalisarnermit aningaasaqarneq – qaleralinnik ningittagarsorluni angallatinik aalisarneq
- Aqutseqataaneq pisuussutinillu nalunaarsueqataanerit ileqqutoqqat



## CBM of Foundational Cultural Species

Pribilof Islands provide:

- Vital breeding and feeding habitat for *laaqudan* (Northern Fur Seal)
- Foraging and resting areas for *qawan* (Steller Sea Lion)
- Migratory seabird and gull habitats

Community members collect local ecological data to support cooperative management efforts



## CBM kulturikkut toqqammaviit assigiinngisitaartukkaat

Pribilof-ip qeqertaani piupput:

- Laaqudan-it erniorfii neriffigisaallu (Northern Fur Seal/puisi)
- Qawan-it neriniarfii eqqissisimaarfiilu (Steller Sea Lion/søløveq)
- Imaani timmissat naajallu ingerlaartuartut sumiiffii

Sumiiffinni pinngortitami uumasoqatigiit pillugit paasisutissanik innuttaaqataasut katersisarput ataatsimoorussamik aqutsinerni suliniutini ikorfartuillutik



## Goals of the Indigenous Sentinel Network

To give remote communities a tool for:

- Recording *real-time and long-term* environmental data
- Communicating information and data broadly

**Foundation 1:** Traditional Ecological Knowledge (TEK) and western science are not “either/or” but instead are different “ways of knowing”

**Foundation 2:** Successful conservation efforts must include local communities (i.e. without local buy-in, most conservation efforts are doomed!)



## Nunap inoqqaaviisa attaveqaqatigiinnikkut anguniagaat

Sumiiffiit avinngarusimasut periusissaannik tuninissaat:

- Avatangiisinik nalunaarsuinerit *pisut ingerlaarnerini piffissamilu sivisuumi* immiussilluni nalunaarsuinerit
- Siammasissumik paasissutissanik nalunaarsukkanillu avitseqaatigiinneq

**Tungavisoq 1:** Ileqqutoqqat toqqammavigalugit pinngortitami uumassuseqaqatigiit ingerlaarngi pillugit ilisimasat (Traditional Ecological Knowledge (TEK)) aammalu nunani kitaamiusuni ilisimatusarnerit imaangilaq “unaangikkuni/ aappaanaa toqqarneqarsinnaasoq” kisiannili “ilisimasat assigiinngisitaartumik ilisimaligaallutik”

**Tungavisoq 2:** Piujuartitsinissani suliniutit iluatittumik ingerlanneqassappata sumiiffinni inuiaqatigiit peqataatinneqartariaqarput (sumiiffinni peqataatitsisoqanngitsillugu amerlanertigut suliniutit iluatsinngitsoortarput!)



# Goals of the Indigenous Sentinel Network

## Addresses key issues:

- Data reliability (Quality Control)
- Data access and sharing
- Data ownership

BeringWatch 2.0 Bruce\_Robson

Bruce\_Robson QCCAR **Quality Control (QCCAR)**

Dashboard  
Observations  
QCCAR  
View All Open  
View All  
Reports  
Observers  
Administration  
Calendar  
CEM

QCCAR  
Showing 1-20 of 1,657 items. 20 items per page

Observer	Related Record	Issue Type	Description	Closed	Created At	Created By	Updated At	Updated By
Aaron Lestenkof	Mobile-Detail-65744	Correct Species Object	1234	Yes	Feb 9, 2018, 6:55:16 PM	Paul Melovidov	Feb 9, 2018, 7:00:18 PM	Aaron Lestenkof
Aaron Lestenkof	Mobile-39657	Missing Weather Condition Entry	No information on environmental conditions provided.	No	Jan 24, 2018, 5:55:02 PM	Lauren Divine	Jan 24, 2018, 5:55:02 PM	Lauren Divine
Pamela Lestenkof	WEB-39658	QC complete no issue found	added image	No	Jan 24, 2018, 1:16:57 AM	Pamela Lestenkof	Jan 24, 2018, 1:40:05 PM	Ricardo Echegaray
Pamela	WEB-Detail-65703	Missing Attached Image		No	Jan 24, 2018,	Pamela Lestenkof	Jan 24, 2018,	Pam Lest

# Nunap inoqqaaviisa attaveqaqatigiinnikkut anguniagaat

## Suliassaqarfiit eqqumaffigineqartussat tunngaviusumik:

- Paasissutissat tutsuiginassusii (Pitsaassutsip qaffasissuunissaanik nakkutilliineq)
- Paasissutissat tigussaeneri avitseqatigiinnerilu
- Paasissutissanik piginnittuuneq



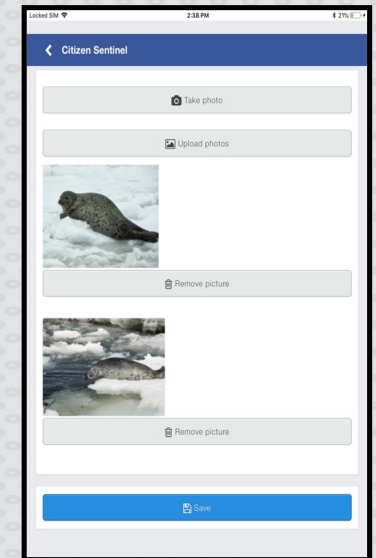
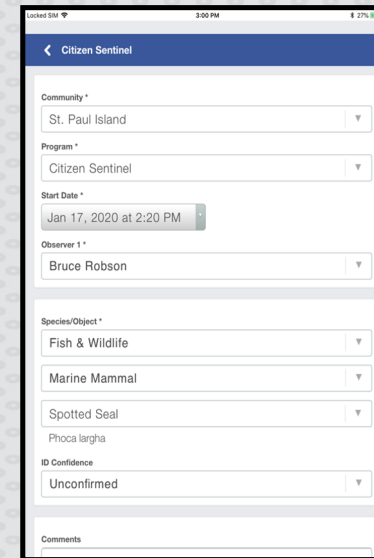
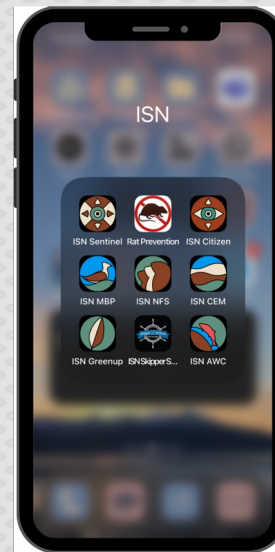
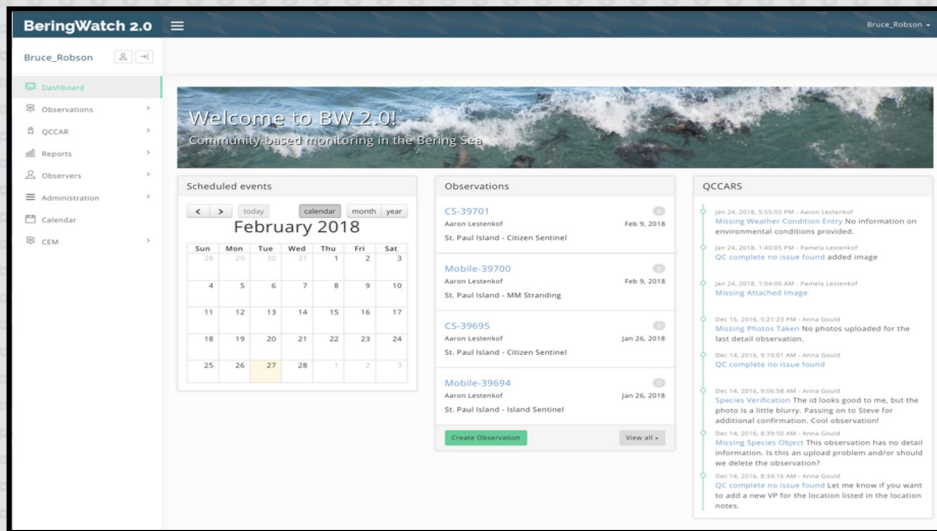


## ISN Components

- Online Database (Bering Watch)
- Data Collection Apps with no wifi or cell signal needed while in the field
- Communication Tools
- Training Materials (e.g., handbook, survey protocols, etc.)

## ISN-i atorlugu atortut

- Internet-ikkut paasissutissat katersuivii (Bering Watch)
- Paasissutissat sulianik katersinerni App-i atorlugu katersat wi-fi-eqarfiunngitsuni atorreqarsinnaasut, imal. Mobilimik attaveqarfiunngitsuni
- Attaveqarnikkut atortut
- Sungiusaatitut atortut (allattuiviit, misissuinerni najoqqutassiat assigisaallu.)





Currently, there are eleven CBM programs within ISN

Each program is designed to meet needs and interests identified by communities

More details at:

[www.sentinelnetwork.org](http://www.sentinelnetwork.org)

Maannarpiaq ISN atorlugu CBM program-imi suliat aqqanillit ingerlanneqarput

Program-it ataasiakkaarlutik inuiaqatigiinni soqutigisat pisariaqartitallu naapertorlugit naleqqussarneqarlutik ilusilersugaapput

Paasissutissat annertusisat ugguuna alakkertikkit:

[www.sentinelnetwork.org](http://www.sentinelnetwork.org)

## Available Apps and Programs



ISN Sentinel



ISN Citizen Sentinel



ISN Coastal Erosion Monitor



ISN Harvest



ISN Migratory Bird Program



ISN Rat Prevention



ISN Northern Fur Seal



ISN Greenup



ISN Skipper Science

Learn more at

<https://skipperscience.org/>



ISN CONAS



ISN Fish Map App

Learn more at

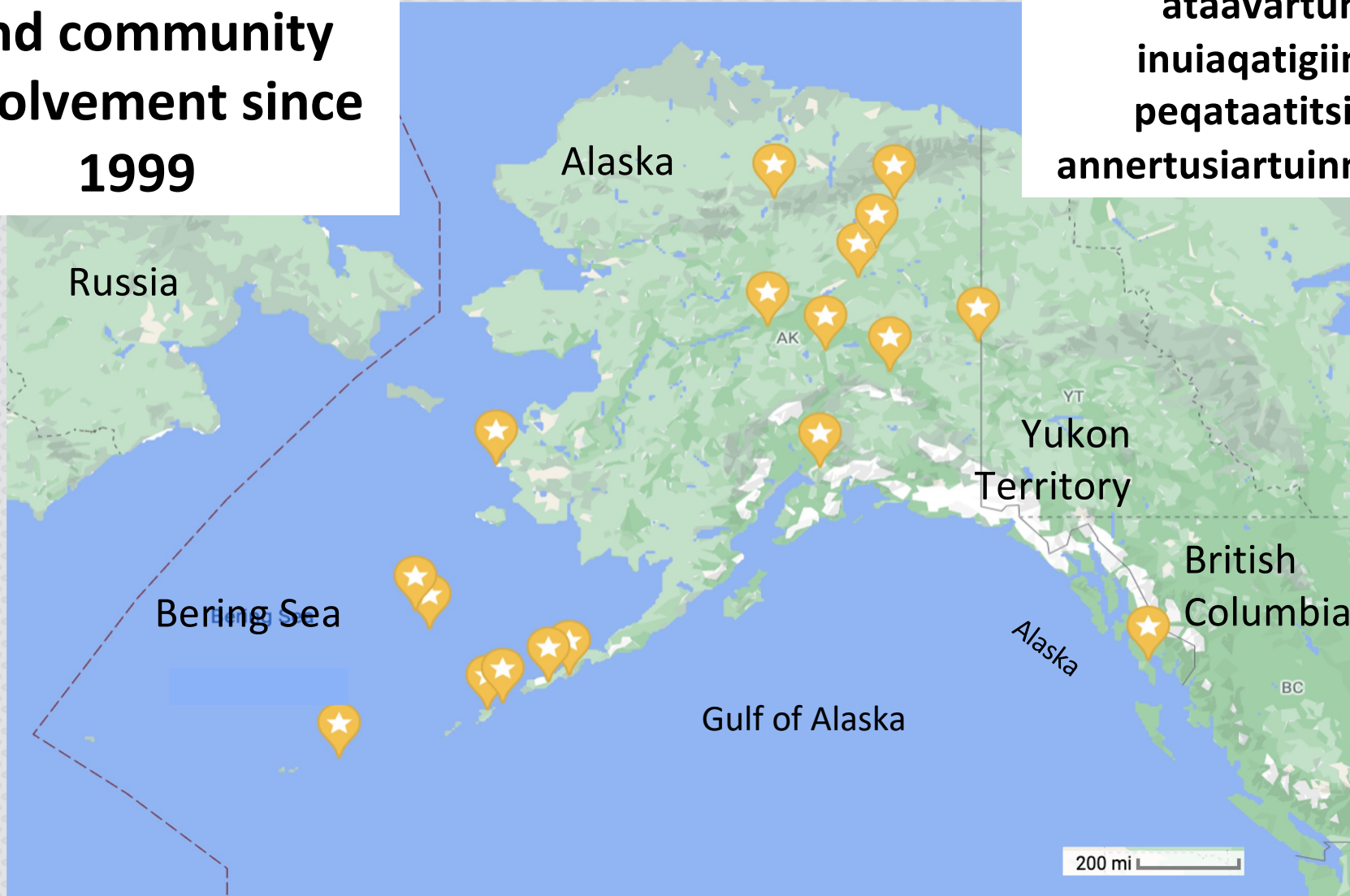
<https://alaskafishmapping.org/>





**Sustained growth  
and community  
involvement since  
1999**

**Ukioq 1999-imili  
ataavartunik  
inuiaqatigiinnik  
peqataatitsineq  
annertusiartuinnavissoq**





## ISN Program Examples: Co-Management of Marine Mammals

Long-term data collection efforts on St. Paul generate:

- valuable information rooted in local-knowledge and context
- help managers and communities understand shifts in migration, health of populations, and more!

ISN-imik program-imik atuinernik assersuut:  
Imaani miluumasunik nalunaarsuiseqataaneq  
Piffissami sivisuumi paasissutissanik katersinerni St.  
Paul-imi suliniutigineqartunit angusat:

- sumiiffimmi ilisimasat pisullu toqqammavigalugit paasissutissanik naleqaqisunik katersineq
- nalunaarsuivinni aqutsisoqarfinnillu ikiuineq inuiaqatigiinni uumasut nikerarnerinik, amerlassusaasa patajaassusiinik allarpassuarnillu ilisimasariaqakkanik siammarterinerni ikiuunneq!



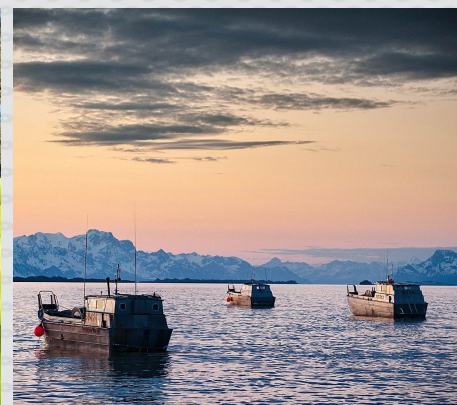

## ISN Program Expansion into Fisheries Research

- Fishing vessel captains requested a program to share knowledge and information with managers via at-sea observations
- “Skipper Science Partnerships” facilitates stronger partnerships between fishermen, climate change researchers, and resource managers

Learn more at [www.skipperscience.org](http://www.skipperscience.org)

## ISN-imik program-i atorlugu Aalisarnermik Ilisimatusarneq ilanngullugu siammarterneqarnera

- Imaani takusat aallaavigalugit ilisimasaniq paasissutissanillu aqutsisut peqatigalugit siammarterivissamik program-imik umiarsuit naalagaat qinnuteqarput
- Skipper-it ilisimatusaatiniq suleqateqarfii, “Skipper Science Partnerships”, aalisartut silaannaallu allanngoriartorneraniq ilisimatusartut akornani suleqatigiiffeqarnernik nukittorsaaffiupput, aammalu pisuussutiniq aqutsisut ilanngullugit





## Benefits of Skipper Science as CBM:

- Data collected on Alaska's fisheries is scientifically rigorous and information is community-owned
- Establishes funding, compensation, and honorariums for fishermen collecting data
- Facilitates research that meets communities needs and interests



## Skipper-it ilisimatusaataat, Skipper Science, CBM-itut pitsaaqutai:

- Alaska-mi aalisarnermit paasissutissat katersat sukannersumik ingerlanneqarput innuttaasunillu pigineqarlutik
- Aningaasaaliissutissanik pilersitsiviusarpoq, taartisiat, aammalu aalisartunut ajunngitsorsiassarsineq paasissutissanik katerseqataasimanersiassat
- Ilisimatusarnerillu inuiaqatigiit pisariaqartitaannik soqutigisaannillu ingerlanneqartarnissaannik aqqutissiuisarluni



Picture provided by Lindsey Bloom



## Key Benefits of ISN

- Federal regulation changes
- Local decisions on key resource management
- Climate adaptation planning
- Capacity building in communities
- Strengthening Data Sovereignty and ownership
- Real-time data collection to supplement other environmental surveys and fill data-gaps

## ISN-ip atornerata qitiusumik iluaqutaaffii

- Naalagaaffiit malittarisassanik allanngorartitsineri
- Pisuussutinik pingaartinneqartunik nakkutilliinerit pillugit sumiiffinni aalajangiinerit ingerlanneqartarneri
- Silaannaap pissusaanut naleqqussarnerup pilersaarusernerani
- Piginnaasanik inuiaqatigiinni nukittorsaanerit
- Paasissutissanik Piginnettussaataanerpaanerup piginntuunerullu nukittorsarnera
- Pisut perpiarnerini paasissutissanik katersinerit avatangiisunik nalunaarsuinerni ingerlanneqartuni allani amigaataasinnaasunik immersueqataanerit paasissutissanillu katersinerit allat ikorfartorneqarneri





## Lessons from ISN: Building Financial and Organizational Sustainability

*Flexibility is key*

ISN has been successful through  
competitive/non-competitive grants

### Main goals for ISN:

1. Secure funding for long-term and widely available use with minimum or no-cost to our Indigenous users
2. Maintain investment from our Tribe in the program and the values that guide our efforts
3. Secure stable funding that includes adequate and equitable compensation for observers/sentinels/guardians



## Sustainability ISN atorlugu suliaqarnerni ilikkakat:

*Eqaatsumik suleriuseqarneq qitiuvoq*

*ISN unammillersinnaanikkut / unammillerfiunngitsunilu  
ajunngitsortassaqarfiuvoq*

### ISN atorlugu tunngaviusumik tunaartarineqartut:

1. Aningaasaliissutissanik pilersitsinissat qulakkeerneqarneri piffissami sivisuumi isigaluni Nunap inoqqaavisalu akornani atuisuni annikitsuinnarmik aningaasartuutitaqartumik imaluunniit aningaasartuutiqanngitsumik
2. Eqimattakkaat program-ikkut ingerlatsineq aqqutigalugit, (Tribe in the program), aningaasaliissutissanik ataavartunik pilersitsineq, aammalu suliniutini ilitsersuutini naleqartitat ilanngullugit
3. Aningaasaliissutissanik pissarsinissani patajaatsunik pilersitsiviusarneri alaatsinaatsuusunut/ingerlatsisunut/illersuisunullu aamma naleqquttunik taarsigassarsisarnerit



## Lessons from ISN: Ensuring Sustainability of Programs

- Networking and collaborating is a shorter path to success
- CBM is not a one size fits all
- Sharing knowledge, resources, or lessons learned with other partners or communities will benefit the collective goals of CBM efforts

*“A rising tide raises all ships.”*



## ISN-imik ilikkakkat: Program-it piujuartinneqarnissaannik qulakkerinnineq

- Attaveqaqatigiinneq suleqatigiinnerlu iluatittumik angusaqarfiunissaannut aqqutissaavoq angusassanik qanillisitsisartoq
- CBM naleqqussagassaavoq pisunut assigiinngisitaartunut
- Ilisimasanik, isumalluutinik imaluunniit misilikkattanit ilisimalikkanik avitseqatigiinneq suleqatigisanik inuiaqatigiinniluunniit CBM-imi suliniutini anguniakkanut iluaqutaassaaq

**“Ulikkiartornera angallatinik tamanik qaqilertitsisarpoq.”**

## Acknowledgements

Qaġalaq ~ Thank you to previous funders and collaborators:

- Aleut Communities of St. Paul and St. George Islands
- Bureau of Indian Affairs Tribal Climate Resilience
- Environmental Protection Agency GAP program
- National Parks Service Beringia Program
- NOAA National Marine Fisheries Service
- North Pacific Research Board
- Pribilof School District
- USFWS Tribal Wildlife Grant Program
- National Resource Conservation Service USDA



University  
of Victoria



St. George Island Institute  
**INDIGENOUS**  
SENTINELS NETWORK



 **INDIGENOUS**  
SENTINELS NETWORK

Qaġaasakuq ~ Thank You!

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ataqatigiissaariusoq

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